DOCUMENT RESUME

ED 249 783 FL 014 609

AUTHOR Lillo-Martin, Diane
TITLE The Acquisition of Task-Specific Word Formation Devices in American Sign Language.
INSTITUTION Salk Inst. for Biological Studies, San Diego, Calif.
PUB DATE Sep 84
NOTE 9p.; In: Papers and Reports on Child Language Development, Volume 23, p74-81 Sep 1984. This research was supported in part by the National Science Foundation and the National Institute of Health.
AVAILABLE FROM PRCLD, Department of Linguistics, Stanford University, Stanford, CA 94305 ($12.00 for entire volume; individual papers not available).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *American Sign Language; *Deafness; Form Classes (Languages); *Language Acquisition; *Language Patterns; *Language Processing; *Morphology (Languages); Young Children

ABSTRACT

The acquisition of several word formation devices in American Sign Language (ASL) by deaf children learning ASL as a native language focused on some devices analogous to word formation devices in spoken languages (compounding, affixation, and derivation) and some in ASL that may not have counterparts in spoken languages. They were examined using two tests, one requiring the subjects to produce a new name for something given a verbal description of its function, and one calling for a new name for an invented item whose picture is provided. The tasks not only test the applicability of several proposed principles of the acquisition of word formation (semantic transparency, formal simplicity, productivity, and conventionality), but also reinforce the importance of using several tasks for revealing a variety of processes. Results indicate that specific tasks call for specific word formation processes to be used, and they are acquired following the principles of formal simplicity and semantic transparency. The results also suggest that tasks involving verbal description of stimuli call for word-based morphological devices while nonverbal pictural presentation of stimuli calls for word formation devices that are not word-based, at least for a visual language. (Author/MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

FRCLD 029
1984

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Stanford Univ.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED249783

FL014609

The Acquisition of Task-Specific Word Formation Devices in American Sign Language

Diane Lillo-Martin
University of California, San Diego
and The Salk Institute for Biological Studies

0. Introduction

This is a study on the acquisition of several word formation devices in American Sign Language. The devices that will be considered include ones which are analagous to some word formation devices in spoken languages, like compounding, affixation, and derivation; and a few devices for coining new words in ASL which may not have similar counterparts in spoken languages. These various word formation devices were examined using two tests: one which required the subjects to produce a new name for something given a verbal description of its function, and another which called for a new name to be produced for an invented item given a picture of it. These two tests allow us to examine the applicability of several proposed principles of the acquisition of word formation; in addition, they reinforce the importance of using several tasks for revealing a variety of processes.

1. Background

Clark and Hecht (1982) is a study examining the coining of new words by children learning English as their native language. When asked to make up a name for a machine or person performing a particular activity, this study found that the youngest children (ages 3;0 - 3;8), responded in two ways: they would coin new compounds, such as a 'build-man' for a man who builds, and 'cleaner-people' for a person who cleans; or they would use already known lexical items such as 'camera' for a machine that looks, and 'trampoline' for a machine that jumps. The oldest children (5;3-6;0), and the adults, used the affix '-er', to produce names such as 'builder', 'cleaner', 'looker', and 'jumper'.

Later, Clark and Berman (1984; Berman, Hecht, and Clark 1982) used the same study to examine the acquisition of word formation in young children learning Hebrew as their native language. The youngest children in this study (3 years) used most often suppletives and a zero conversion device which nominalizes the present-tense participial verb form; while the older children used one of a few devices involving affixation of *-an*, and compounding. The adults in the Hebrew study used one of the *-an* affixing devices.

Clark et al. proposed four principles to be used in the acquisition of word formation which they supported with

these two studies. These principles follow.

> I. Principle of Transparency: Known elements with one-to-one matches of meanings to forms are more transparent for constructing and interpreting new words than elements with one-many or many-one matches. (Clark and Hecht 1982, p.4)
>
> II. Principle of Formal Simplicity: Simpler forms are easier to acquire than more complex ones, where simplicity is measured by the degree of change in a form. The less a word-form changes, the simpler it is. (Clark and Berman 1984, p. 9)
>
> III. Principle of Productivity: Those word-formation devices used most often by adults in word innovations are the most productive in the language for constructing new word-forms. (Clark and Hecht 1982, p.6)
>
> IV. Principle of Conventionality: For certain meanings, there is a conventional word or word-formation device that should be used in the language community. (Clark and Hecht 1982, p.8)

The principle of Transparency was postulated to explain the early occurrence of compounds such as 'build-man' in the English experiment. Since compounds combine known meanings and forms in a one-to-one manner, they are supposed to be transparent and thus easily learnable. The principle of Simplicity underlies the fact that the youngest Hebrew-speaking children used zero conversion rather than compounding to respond to the test. Transparency correctly predicts the use of the transparent -an device early on for the Hebrew-speaking children. The last two principles are postulated to account for the child's development into conformity with adult usage.

The results of the two tests for Hebrew and English suggest that:

> [F]ormal simplicity appears to carry more weight for the younger children than semantic transparency... The general shift, from age four on, to word-forms that were semantically transparent in addition to being relatively simple in form suggests that by that age, children have become conscious of the need for novel words to be transparent to addressees as well as simple for speakers. (Clark and Berman 1984, p. 51)

In order to examine the applicability of these proposed principles for a third language, and to investigate the acquistion of word formation in American Sign Language, this test has been given to young deaf children learning ASL as their native language.

2. The People and Machines Test

2.1 Procedure

In this test (paralleling the studies done by Clark, Hecht, and Berman), the children are told what the characteristic activity of a certain machine is, and they are asked to create a new sign for this machine. For example, the child might be told in ASL, "I have a picture of a machine which feeds babies. What would you call a machine which feeds babies?" At this point, the children are expected to coin a new name for this novel object. After they respond, they are shown a picture of the object. Half of the stimuli involved novel machines, and the other half contained questions concerning people, such as, "I have a picture of a girl who tears paper. What would you call a girl who tears paper?" Again, a new name is expected. Examples of the pictures shown after the child responded are given in Figure 1.

Figure 1: Examples from the People and Machines test.

2.2 Subjects

This test was given to 24 deaf children with deaf parents who are learning ASL as their first language. These children were divided into four age groups as follows: Group I: four children ages 3 to 4; Group II: five children ages 5 to 6; Group III: six children ages 7 to 8; and Group IV: 9 children ages 9 to 10. In addition, sixteen deaf adults were given this test.

2.3 Results

The results from the people and machines test are presented as percentages for each response type in Figure 2. There were three devices used to create new nouns, and these three were used by all age levels. The groups differed, however, on the proportion of the use of these three devices. (See Bellugi and Newkirk 1981 for a discussion of the word-formation devices available in ASL.)

Figure 2: People and Machines Test

Group	Compounds	Affixation	Derivation	Other
I	15.0	30.0	50.0	5.0
II	25.0	21.7	46.7	6.6
III	23.6	9.7	43.1	23.6
IV	25.9	42.6	24.0	7.4
Adults	36.6	16.4	23.3	23.7

Unlike the children in the English study, the youngest children in this study did not use compounds very often. The older children used compounding slightly more often, and then the adults used it rather frequently. If the principle of transparency alone were at work here, then we might expect to see compounding used often by the young children, as it was in the English study, especially given its relative productivity for the adults.

The agentive affix borrowed from English, -ER, was mostly used by the older children. The adults did not use it to a large extent. This disparity could be explained by the situation in which the tests were done: the children were tested at their school, and the oldest ones might have used this device because of the English environment. It should be noted that the use of this device was restricted mostly to a few children who used it almost exclusively, while others seldom used it.

In the initial analysis, it seemed as though the deverbal derivation process in ASL was not used much by the youngest children. Using this device, related nouns and verbs have the same handshapes and locations, while the verbs are made with a longer, continuous movement, and their related nouns are made with smaller, repeated, and restrained movement (Supalla and Newport 1978). However, for the youngest group of children, most of the responses in the 'other' category were single forms whose handshapes and locations were identical to the verb given in the stimulus. The movement used was a combination of the movements used in the verb form and those that would be used in the proper deverbal derivation. Launer (1982) found that young deaf children do not always systematically distinguish between related nouns and verbs using the correct movement parameters. Rather, she found that they would sometimes use a combination of correct and incorrect aspects of movement. For the older groups of children and the adults in this study, this kind of response was used much less often (the responses in the 'other' category for them were mostly noun phrases describing the objects or established lexical items whose meanings were extended to cover the new items).

It it evident then that in many cases the youngest children were basing their noun signs on the same root as the verb stimulus given; but their responses were not initially scored as derivations because the movement they used was improper for a deverbal derivation. Therefore, the number of these same root quasi-derivations was added to the initial derivation score to produce the scores given in Figure 2. It is clear that the youngest children used most frequently these derivations and quasi-derivations, and the use of these forms gradually declined with age.

2.4 Discussion

In their discussion of the proposed principles for the acquisition of word formation devices, Clark et al. give strategies attending each principle. Of greatest interest here are the strategies for Transparency and Simplicity, which are given respectively below:

> a. In production, look for word-formation devices that use whole words as their elements and add them to your repertoire for constructing new words.
>
> b. Make as few changes as possible in forming a new word from an old one. (Clark and Berman 1984, p. 8-9)

Following these strategies, the ASL options of compounding and affixation would be considered transparent. The minimal movement change in the derivations and quasi-derivations could be considered Simple. This breakdown, and the results from the test given in ASL would support, along with the Hebrew data, the necessity for the principle of Simplicity to take precedence over the principle of Transparency for the youngest children. The gradual decrease in the use of derivations and increase in the use of compounding further support the proposal that Transparency, Productivity, and Conventionality soon come into play in the child's development of word formation devices.

3. The Invented Objects Test

3.1 Procedure

Another word formation test has also been developed and given to deaf children learning ASL from their deaf parents. In this test, as in the previous one, the children were asked to create a new name for a novel object. However, the presentation of this test was different from that of the people and machines test. In this Invented Objects test, the children were simply shown a picture of an odd object, without being told its function. Simply on the basis of the appearance of the object in this picture, the children were asked to create a name for it. After making the sign, the children were shown a picture of a person using the object in some way. When shown this picture they were asked to create a verb for the activity which the person was doing.

This method of presentation was used for the first half of the test only; for the second half, the order was reversed: the children were shown pictures of someone using an odd object first, and asked to create a verb. Following the activity picture, the picture of the object alone was shown, and the children were asked to create the noun. Example pictures are given in Figure 3.

Figure 3: Examples from the Invented Objects Test.

3.2 Subjects

This test was given to 30 deaf children having deaf parents. The groups were as follows: Group I: 4 children ages 3-4; Group II: 5 children ages 5-6; Group III: 11 children ages 7-8; and Group IV: 11 children ages 9-10. Twenty-four deaf adults were also given this test.

3.3 Results

The responses for this test, given in percentages in Figure 4, were quite different from those for the people and machines test.

Figure 4: Invented Objects Test

Group	Compounds	Extensions	Neologisms	Descriptions
I	7.4	40.0	50.5	2.1
II	14.2	25.8	58.3	1.7
III	16.7	30.3	50.4	2.3
IV	12.5	40.8	42.1	3.7
Adults	20.9	17.0	33.7	28.1

The affixation device was not used at all in this test. Compounds were used, but only by 7% of the youngest children and increasing to 20% for the adults. 'Extensions' refers to the cases for which subjects responded using a known lexical item whose meaning was extended to cover the meaning for the new object (responses like these were counted as 'suppletives' in the Clark studies, and in the 'other' category in the ASL People and Machines study). An example of this would be calling the first item shown an 'ice cream cone'. This happened 40% of the time for the youngest children, decreasing to 17% for the adults.

The remaining two word formation devices listed represent types of devices sometimes called 'mimetic depiction'. The handshape, location, and movement parameters used in established lexical signs can be used to form new signs which often have mimetic qualities, although these mimetic signs are stil constrained by the formal properties of lexeme formation in ASL. Specific handshapes are used, and the configurations of the hands usually represent something visually salient about the new object; the movement is generally representative of the movement inherent in the new object or its use. 'Mimetic depiction' is often used in descriptions and story-telling, but it can

also be used for the creation of single new lexical items, such as the sign for HANG-GLIDER.

This kind of option for word formation seems special to the visual-gestural modality. It is not word-based, in that it does not modify existing lexical items; therefore it is not Transparent in the sense outlined above. Rather, it draws on partially meaningful sub-lexical elements to construct new forms; this constructivity is not Simple. Newport (1982) and Supalla (1982) have argued for the morphological complexity of verbs of movement and location. In the same way, these forms can be seen as composed of meaningful elements.

There are two ways in which this kind of construction of new lexical items was made in the responses to this test. In one way, the specific handshapes used for size and shape specifiers can be conjoined in such a way as to describe explicitly what the item looks like. This is labelled 'Descriptions'. The other possibility is to use these specific handshapes and movements to represent the appearance of the object, using movement primes which are closer in length to those for established lexical items. These new signs are more like single lexical item signs, and so have been labeled 'Neologisms'. It is clear that the neologisms are the most preferred device for all age groups, and especially for the young children.

3.4 Discussion

Considered together, the (so-called) 'mimetic' devices were highly used in this test. Further, these kinds of responses are obviously quite different from the responses to the earlier test. These kinds of non word-based devices, in which a new word is constructed from meaningful sub-lexical elements, were not used in the people and machines test. They were heavily relied upon here, where the subject was not given verbally the function of the object he was naming, but only saw pictorally its size, shape, and movement. Unlike the derivations used in the people and machines test, which were made with minimal change, these responses were highly complex. The results from this test are clearly different from those for the earlier test.

How general is this use of devices not based on the established lexicon for responding to the pictoral presentation of stimuli as described here? Although the following studies have not been completed formally, it is worthwhile to note here two preliminary findings. First, when we presented several hearing adults with these pictures and asked them to name them in English, they responded using word-based devices, either extending the meaning of known lexical items, such as "funnel" or "pillow", or making compounds such as "donut-maker". Secondly, these pictures have been given to a native deaf

signer in Hong Kong. Preliminary results suggest that he uses both word-based and non-word based word formation in Chinese Sign Language for naming these invented objects.

4. Conclusion

What can we conclude about the acquisition of word formation in ASL? We saw that specific tasks call for specific word formation processes to be used. The use of these processes may be acquired following the principles of Formal Simplicity and Semantic Transparency, at least for some word-formation tasks and devices. In addition, the results of the tests discussed here suggest that tasks involving verbal description of stimuli call for word-based morphological devices; while, at least for a visual language, a task involving non-verbal pictural presentation of stimuli calls for word formation devices which are not word-based. The special effects of non-verbal stimuli, and the use of word formation devices which are not word-based, are quite possibly prime examples of effects which the visual modality can have on the structure and acquisition of a visual language.

ACKNOWLEDGEMENTS

This work was supported in part by National Institutes of Health Grants NS15175 and HD13249, and by National Science Foundation grant #BNS83-09860 to Dr. Ursula Bellugi at the Salk Institute for Biological Studies. We are grateful to the following people and institutions for the subjects who participated in the experiments and for facilities: George Attletweed, Ohlone College, Fremont, California; Dr. Ray Jones, California State University at Northridge; Dr. Henry Klopping, California School for the Deaf, Fremont, California.

Many thanks go to those subjects who participated in this experiment, and to the people who helped with it: Maureen O'Grady, Lucinda Struxness, Dennis Schemenauer, and Leslie Jamison. Special thanks to Drs. U. Bellugi, E. Klima, and B. Hecht for support and quite beneficial discussions of this experiment. Illustrations were drawn by Frank A. Paul.

REFERENCES

Bellugi, U., and Newkirk, D. (1981). Formal Devices for Creating New Signs in American Sign Language. Sign Language Studies 30, 1-35.

Berman, R., Hecht, B., and Clark, E. (1982). The Acquisition of Agent and Instrument Noun Forms in Hebrew. Papers and Reports on Child Language Development 21, 16-24.

Clark, E., and Berman, R. (1984). Structure and Use in the Acquisition of Word-Formation. To appear in Language 60.3.

Clark, E., and Hecht, B. (1982). Learning to Coin Agent and Instrument Nouns. Cognition 12, 1-24.

Launer, P. (1982). A Plane is Not to Fly. Doctoral Dissertation, New York University.

Newport, E. (1982). Task Specificity in Language Learning? Evidence from Speech perception and American Sign Language. In E. Wanner and L. Gleitman, eds., Language Acquisition: The State of the Art. 450-486. Cambridge: Cambridge University Press.

Supalla, T. (1982). Structure and Acquisition of Verbs of Motion and Location in American Sign Language. Doctoral dissertation, University of Californai, San Diego.

Supalla, T., and Newport, E. (1978). How Many Seats in a Chair: The Derivation of Nouns and Verbs in ASL. In Siple, P., (ed.), Understanding Language Through Sign Language Research. 91-132. New York: Academic Press.